

BRIDGE INSPECTION REPORT

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Status: Released

Printed On: 2/15/2019

Agency: Washington State

CD Guid: b7516246-d5ee-4dab-b675-756a26a61150

Release Date: 1/31/2019

Program Mgr: Harvey L. Coffman

Br. No. 5/538S-E SID 0007741P

Br. Name S-E RAMP OVER I-5

Carrying I-5 SB OFF RAMP

Route On 00005

Mile Post 163.05

Intersecting S-E RAMP TO COLUMBIA WAY

Route Under 00005

Mile Post 163.05

Inspector's Signature JAC

Cert # G1819

Cert Exp Date 7/16/2023

Co-Inspector's Signature DAM

Inspections Performed

Report Type	Inspection Type	Date	Freq	Hours	Inspector	Cert No	Co-Insp.
Routine		9/24/2018	24	4.0	TKK	G1303	DWH
Damage	Other	1/25/2019		1.0	JAC	G1819	DAM
Geometric		1/1/2004	72	1.0	GGI	GEOM	DJM

8	<input type="checkbox"/> Alignment (1661)	<input type="checkbox"/> Operating Tons (1552)	0	<input type="checkbox"/> Bridge Rails (1684)	0	<input type="checkbox"/> No Utilities (2675)
6	<input type="checkbox"/> Deck Overall (1663)	0.60 <input type="checkbox"/> Op RF (1553)	1	<input type="checkbox"/> Transition (1685)	0.00	<input type="checkbox"/> Asphalt Depth (2610)
6	<input type="checkbox"/> Superstructure (1671)	<input type="checkbox"/> Inventory Tons (1555)	1	<input type="checkbox"/> Guardrails (1686)	1967	<input type="checkbox"/> Year Built (1332)
6	<input type="checkbox"/> Substructure (1676)	0.46 <input type="checkbox"/> Inv RF (1556)	1	<input type="checkbox"/> Terminals (1687)	0	<input type="checkbox"/> Year Rebuilt (1336)
9	<input type="checkbox"/> Culvert (1678)	5 <input type="checkbox"/> Operating Level (1660)	39.0	<input type="checkbox"/> Bridge Rail Ht (2612)		
9	<input type="checkbox"/> Chan/Protection (1677)	A <input type="checkbox"/> Open/Closed (1293)		<input type="checkbox"/> Design Curb Ht (2611)		
N	<input type="checkbox"/> Pier/Abut/Prot (1679)	3 <input type="checkbox"/> Structural Eval (1657)				
9	<input type="checkbox"/> Waterway (1662)	5 <input type="checkbox"/> Deck Geometry (1658)				
N	<input type="checkbox"/> Scour (1680)	3 <input type="checkbox"/> Underclearance (1659)				

NBIS Risk Category

Low Risk

Inspection Flags

<input type="checkbox"/> Soundings (2693)	<input type="checkbox"/> Measure Clearance (2694)	<input type="checkbox"/> Revise Rating (2688)	<input type="checkbox"/> Photos (2691)	<input type="checkbox"/> QA Flag (2695)
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BMS Elements

Element	Element Description	Total	Units	CS 1	CS 2	CS 3	CS 4
12	Concrete Deck	13,923	SF	13,914	0	0	9
13	Bridge Deck Surface	15,939	SF	15,939	0	0	0
35	Concrete Deck Soffit	13,923	SF	13,923	0	0	0
38	Concrete Slab	15,939	SF	15,939	0	0	0
105	Concrete Box Girder	663	LF	641	0	22	0
200	Abutment Fill	2	EA	2	0	0	0
205	Concrete Pile/Column	36	EA	35	0	1	0
207	Concrete Pile/Column w/Steel Jacket	7	EA	7	0	0	0
215	Concrete Abutment	26	LF	24	0	2	0
311	Moveable Bearing (roller, sliding, etc)	46	EA	46	0	0	0
321	Concrete Roadway Approach Slab	1	SF	1	0	0	0
330	Metal Bridge Railing	2,844	LF	2,828	0	16	0
331	Concrete Bridge Railing	2,844	LF	2,821	0	23	0
370	Seismic - Longitudinal Restrainer	14	EA	14	0	0	0
371	Seismic - Transverse Restrainer	9	EA	9	0	0	0

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Carrying I-5 SB OFF RAMP		Route On 00005 Mile Post 163.05
Intersecting S-E RAMP TO COLUMBIA WAY		Route Under 00005 Mile Post 163.05

BMS Elements (Continued)

Element	Element Description	Total	Units	CS 1	CS 2	CS 3	CS 4
402	Open Concrete Joint	21	LF	21	0	0	0
408	Steel Sliding Plate	168	LF	0	105	63	0
710	Bridge Mounted Sign	1	EA	1	0	0	0

Notes

- 0 Bridge is oriented north to south beginning at the hinge shared with north end of Bridge #5/539W. See layout in the bridge list. Cantilevered slab section to the north is Span 0. All quantities associated with the Pier 0 shared joint are quantified with bridge 5/539W as the dependent structure. Bridge #5/538 S-W supports Span 18 of this structure. All quantities associated with the Span 18 shared joint are quantified with this bridge as the dependent.
- 12 Concrete deck begins at the south cantilever of Span 18 and continues through Span 25. Deck is worn to aggregate in the wheel lines with light scale in places and scattered transverse hairline cracks, heaviest over the piers with areas of map cracking. See photo #12. Span 23 has two open core holes on either side of the joint (four total).
- 13 Deck surface in Spans 1 through 17 and the north cantilever of Span 18, is worn to aggregate in the wheel lines with areas of light scale, transverse cracking over the piers, and areas of map cracking.
- 35 Soffit has transverse leaching cracks in the overhangs. Span 23 has multiple transverse leaching cracks at midspan.
- DAMAGE Inspection 1/25/2019:
Span 23, east edge over northbound I-5, has an 8 ft. x 3 ft. area of scaling/minor spalls from the fire. See photo #37.
- 38 Concrete slab has exposed rusty rebar chairs throughout the bottom. Spans 13 through 17 have efflorescence with leaching cracks along the centerline construction joint.
- 105 Concrete box girder webs have vertical and diagonal hairline cracks with some leaching and rust staining. Some cracking extends into the bottom of the box. Bottom of the box has a few short longitudinal and transverse hairline leaching cracks with some rust staining. Span 23 joint near north end bottom corner edge has a 10" diameter x 1" deep spall. See photo #30. Span 23 over Lane 1 of northbound I-5 has a 12" x 12" x 4" deep rock pocket with bottom mat rebar exposed. See photo #17. REPAIR #10003. North hatch in Span 23 has some rust staining. Span 23 drains holes for the interior of the box girder were placed at the high point and water does not drain. Water in this cell moves from east to west. See photo #22. REPAIR #10001. Span 24 south side of box has a 5 ft. long delamination. See photo #31.
- DAMAGE Inspection 1/25/2019:
Span 23, over I-5 northbound lane 1, bottom and east web of the box has a 10 ft. x 15 ft. area of light scaling/spalling from the fire. The box was sounded and 6" either side of the edge between the web and flange were found to be delaminated. Three transverse rebar are exposed up to 1 ft. in length and appear undamaged. The east hatch near joint 23 melted in the middle and now hangs approximately 12" lower. See photos #32, #33, #34 and #35. REPAIR #10004, #10005, #10006.
- 205 Concrete columns have horizontal hairline cracks at the top with scattered hairline map cracking. A few of the horizontal struts have vertical hairline cracks near the ends. Column 13B has an 18 ft. long narrow vertical crack with radial map cracking at the top that is leaching. See photo #5. Shafts at Piers 7, 8, 9 and 10 are exposed up to 10 ft. high, at Column 8B, below the original ground level due to construction. See photo #13.
- 207 Concrete columns with steel jackets are located at Piers 19 through 25. Column 19 has steel covers mounted to the east face to protect utilities.
- 215 Concrete abutment at the south end, has short vertical leaching cracks. East end of the south abutment has a 17" x 20" x 6" deep spall with 6" of exposed rusty rebar. See photo #27.

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Notes (Continued)

311 Roller bearings are located, three each, in the Span 20 and 23 hinges and at Pier 26. Steel sliding plates are located at the in-span hinges with twelve in Span 18, nine in Span 12, and six each in Spans 8, and 4. Paint on the plates is blistering and flaking throughout with areas of surface rust. Bearings at Pier 0 are inventoried and inspected with 5/539W.

330 Metal bridge railing over Span 1 on the west side is missing an 8 ft. section. See photo #19. REPAIR #10000. Span 16 west rail has an 8 ft. damaged section near 5/538S-W. See photos #8 and #20. REPAIR #10000.

331 Concrete bridge railing has scattered vertical hairline leaching cracks and traffic scrapes with small edge spalls in the curbs. On the west rail, at the second arrow sign from the north, (in Span 22), there is a 18" long spall from impact damage. The metal rail post anchorage into the spalled area are detached. See photo #28. REPAIR #10000.

DAMAGE Inspection 1/25/2019:

Span 23, east rail over northbound I-5 lane 1, has minor scaling/spalling from the fire. The edge between the rail face and the small overhang on the rail have minor delaminated concrete. See photo #36. REPAIR #10004.

370 Longitudinal restrainers are located four each in Span 18 and two each in Spans 4, 8, 12, 20 and 23. Restrainers are closely inspected on a 72 month frequency with equipment and are next due for inspection in 2024. Restrainer gaps measured at approximately 50° F in 2018.
 Span 4 joint measures 1-1/4".
 Span 8 joint measures 1-1/8".
 Span 12 joint measures 1-1/8".
 Span 18 joint shared with 5/538S-E measures 1".
 Span 18 joint shared with 5/538S-W measures 1".
 Span 20 joint measures 2-1/2".
 Span 23 joint measures 2-1/2".
 Restrainer gaps are uniform at each joint and jam nuts are tight.

371 Transverse restrainers are located two each in the cells of Spans 20 and 23. Cross braced dywidag bars in slab Spans 4, 8, 12 are counted as single units with two units in Span 18.

402 Open concrete joint has rubber filler breaking up and leaking over the south abutment.

408 Steel sliding plate joints are filled with debris and have minor "D" spalling along the plate edges. See photo #11. Many joint sliding plates are missing over half of the hold down screws. Span 4 joint, along the north side has up 12 lineal feet of spalling up to 5" wide x 1" deep. See photo #24. Span 12 joint has two spalls in the wheel lines up to 16" x 5" x 1" deep. See photo #23. Span 18 joint shared with 5/538 S-W has minor edge spalls over 8 ft. See photo #29.

Joints are measured at the west white fogline:

Year	Pier 1	Span 4	Span 8	Span 12	Span 18	Span 20	Span 23	Span 25	Time	Temp.
2018	2-1/8"	2-1/8"	2-3/8"	2-1/2"	2-1/8"	2-7/8"	2-5/8"	2-1/2"	10:15 am	60° F
2016	2-1/8"	2-1/8"	2-1/8"	2-3/8"	2"	2-3/4"	2-5/8"	2-1/2"	10:15 am	60° F
2014	2"	2"	2"	2-1/4"	2"	2-1/2"	2-1/2"	2-1/2"	7:00 pm	60° F

710 Sign Bridge SB02039 mounted over Pier 17.

1684 Bridge rails do not meet current crash test standards.

2694 Partial clearance checked on 03/11/2014. Minimum clearance measured to be 16' 6" below the north bottom edge of bridge to the left yellow fog line stripe along I-5 northbound. Need to collect the I-5 Southbound traffic measurements, added to LIDAR list for 2016. Vertical clearance over the deck was recorded to be a minimum of 17'-1" along the southwest corner of bridge 5/537N. The vertical clearance measurements are also recorded on bridge 5/537N. Please retain the following information for Information Group purposes. Overcrossing override values to bridge 5/537N.

Repairs

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Repair No	Pr	R	Repair Descriptions	BMS	Noted	Maint	Verified
10000	1	B	Repair damaged aluminum rail, concrete rail and rail anchorages in Span 1, Span 16 (near beginning of bridge 5/538S-W) and span 22..	330, 331	7/6/2004		
10001	1	B	Core 2 inch hole in Span 23 north cell near north exterior web at low point, to drain water collecting in cell. Repair location detailed in the four sheets attached in the files tab. DAG 2012: Although drains are located in this cell, they were placed at the high point. Water flows away from the drain due to a design error. Continue with repair as called out.	105	8/13/2007	11/2/2007	
10003	2	B	Span 23 over Lane 1 of northbound I-5 has a 12" x 12" x 4" deep rock pocket. Chip out loose concrete, clean and paint rebar with a rust inhibitor, and patch.	105	9/7/2010		
10004	1	B	Span 23 east edge of box web/flange, concrete bridge rail/soffit and rail overhang, scale and remove loose and delaminated concrete. Coat exposed rebar with an approved material. Maintenance was notified by email of this repair.	105, 331	1/25/2019		
10005	1	B	Span 23 east hatch near joint 23, remove melted hatch and replace with a screen or new hatch. Maintenance was notified by email of this repair.	105	1/25/2019		
10006	2	B	Span 23 just north of east hatch by joint 23, coat the three exposed rebar with a rust inhibitor.	105	1/25/2019		

Inspections Performed and Resources Required

Report Type	Date	Freq	Hrs	Insp	CertNo	Coinsp	Note	
Routine	9/24/2018	24	4.0	TKK	G1303	DWH		
Resources	Hours	Min	Pref	Max	Freq Date	Need Date	Override	Notes
UBIT	1.50	52	52	62	72 10/13/2018	9/15/2024	9/15/2024	UB-52 used in 2018 from top of deck to access in-span hinges within Spans 4, 8, 12, 18 and 20. Spans 4, 8, 12, 20 and 23 require a 65 ft. bucket truck for hinge access (access below bridge was fairly limited in 2018 and it was decided that it would be easier and safer due to uneven terrain below bridge to use UBIT, except Span 23 in-span hinge) Bucket truck only used in 2018 to access Span 23 hinge from right shoulder of northbound I-5. 85 ft. genie is required to access Span 18 hinge. UBIT could also be used but genie is preferred as many structures in vicinity require genie (access below bridge was fairly limited in 2018 and it was decided that it would be easier and safer due to uneven terrain below bridge to use UBIT).
Bucket	0.50				72 10/13/2018	9/15/2024	9/15/2024	
Platform					72	9/15/2024	9/15/2024	
Flagging								
Keys								Flagging is required for right shoulder closure NB I-5 to access the Span 23 hinge with bucket. Flagging was also needed in 2018 to deploy UBIT from deck.
Deck Inspection								NM-26 key required to access hatches.
Damage	1/25/2019		1.0	JAC	G1819	DAM	Deck was walked without an attenuator in 2018 along the west shoulder.	
Geometric	1/1/2004	72	1.0	GGI	GEOM	DJM	A bus caught fire on 1/25/2019 and parked on the I-5 shoulder underneath the structure, Span 23, East side. See elements 35, 105 and 331.	
Resources	Hours	Min	Pref	Max	Freq Date	Need Date	Override	Notes
LIDR								VC card actually collected 3/11/2014